

MSC Guidelines for Review of Periodic Safety Test Procedures

Procedure Number: E2-17

Revision Date: 04/27/00

References

- a. Title 46 CFR Titles 58, 61 and 62
 - b. Title 46 CFR Parts 111 and 112
 - c. Navigation and Inspection Circular (NVIC) 2-89, "Guide for Electrical Installations on Merchant Vessels and Mobile Offshore Drilling Units"
 - d. American Bureau of Shipping (ABS), "Rules for Building and Classing Vessels under 90 Meters in Length", 1996
 - e. Safety Of Life at Sea (SOLAS), Consolidated Editions, 1997, Chapter II-1, Part D
 - f. MSC Guideline Procedures E2-1, E2-5, and E2-18
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Disclaimer

These guidelines were developed by the Marine Safety Center staff as an aid in the preparation and review of vessel plans and submissions. They were developed to supplement existing guidance. They are not intended to substitute or replace laws, regulations, or other official Coast Guard policy documents. The responsibility to demonstrate compliance with all applicable laws and regulations still rests with the plan submitter. The Coast Guard and the U. S. Department of Transportation expressly disclaim liability resulting from the use of this document.

Contact Information

If you have any questions or comments concerning this document, please contact the Marine Safety Center by e-mail or phone. Please refer to the Procedure Number: **E2-17**

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General Review Guidance

- Upon satisfactory completion of review of the Periodic Safety Test Procedure (PSTP) submittal, the document is forwarded to the Officer in Charge, Marine Inspection (OCMI), with our recommendation for approval. Persons designated by the owner of the vessel conduct all tests in the presence of the Coast Guard. The OCMI approves the document based upon satisfactory completion of the required operational tests using the test procedures in the PSTP document. An approved copy of the PSTP document is to be retained aboard the vessel. See 46 CFR 61.40-1(c).
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- The scope of review should check for completeness of the document and should reflect the machinery installation on the vessel. Systems to be included in the document are as follows (46 CFR 61.40-6):
 - a. Propulsion.
 - b. Maneuvering.
 - c. Electric power generation and distribution.
 - d. Fire detection and extinguishing systems.
 - e. Flooding safety (includes flooding detection, watertight integrity and dewatering systems)
 - f. Emergency internal communications.
- Tests of the systems above should demonstrate the proper operation of the following, as applicable:
 - a. Primary and alternate controls.
 - b. Alarms.
 - c. Power sources.
 - d. Transfer override arrangements.
 - e. Interlocks.
 - f. Safety controls.
- Check test procedure details (46 CFR 61.40-10):
 - a. The test procedures should be in a step-by-step or check-off list format
 - b. The test instructions should specify the following:
 - (i) equipment status
 - (ii) apparatus necessary to perform the tests
 - (iii) safety precautions
 - (iv) safety control and alarm setpoints
 - (v) procedures to be followed
 - (vi) the expected test results
 - c. Test techniques should not simulate monitored system conditions by misadjustment, artificial signals, improper wiring, tampering, or revision of the system, unless the test would otherwise damage equipment or endanger personnel. Examples: Lowering or raising alarm setpoints, instead of testing the alarm at its setpoint, are considered misadjustment. Disconnecting a sensor and inducing a signal in place of the sensor is

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considered introducing an artificial signal and does not test the operational condition of the sensor. Lifting a connection lead or shorting connection leads to a sensor to cause an alarm condition does not test the operational condition of the sensor, and are considered improper wiring or tampering.

- d. Tests that could potentially damage equipment or endanger personnel may use synthesized signals or other conditions applied to the sensor(s) as an acceptable substitute. However, test equipment should be maintained in good working order and calibrated to the satisfaction of the local marine inspector. For example: Testing of the electrical overspeed of a gas turbine engine is dangerous and may be simulated by using a signal generator to simulate the speed input to an overspeed sensing device. The overspeed trip can be verified by observing the operation of the fuel oil trip valves or fuel oil actuator without actually running the gas turbine engine.
- e. Other test techniques that do not meet the above descriptions should be approved by the Commandant (G-MSE).
- Operational Tests of Propulsion and Maneuvering.
 - a. Demonstrate proper operation of the following from the navigating bridge and ECC or maneuvering platform (pilothouse control is not required for a manned machinery plant operation):
 - (i) propulsion system's automatic or remote control of speed and direction of propulsion thrust for each independent propeller controlled
 - (ii) automatic performance of all associated services
 - (iii) rate of movement of the propulsion control device should not cause overload or unintentional shutdown of propulsion machinery
 - (iv) back up propulsion controls, if provided in the remote control stations
 - (v) control overrides of automatic controls and interlocks (if provided)
 - (vi) propulsion automatic safety trip controls
 - (vii) manual alternate propulsion controls at the equipment
 - (viii) the guarded manually actuated safety trip (emergency shutdown) control for each independent propeller controlled at each remote control station, and local manual safety trip control

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- (ix) propulsion control transfers, control override of secondary remote control stations, and control override of all remote control stations from the manual alternate propulsion control location
 - (x) propulsion alarms requiring immediate attention of the navigating bridge watch officer for the safe navigation of the vessel.
- b. For minimally attended machinery plant operation:
 - (xi) control of standby propulsion auxiliaries,
 - (xii) propulsion alarms and instrumentation
- c. For periodically unattended machinery plant operation:
 - (xiii) automatic transfer of vital propulsion auxiliaries upon failure of the operating unit (not required for propulsion systems provided in independent duplicates)
 - (xiv) Propulsion alarms extended to the engineers' accommodations.
- Electric Power Generation and Distribution
 - a. Operation of the automatic power management system, if provided.
 - b. Generator automatic and manual safety trip controls.
 - c. Parallel operation of generators and load shedding, if provided
 - d. For minimally attended machinery plant operation, capability to place a ship service and/or propulsion generator in service within 30 seconds.
 - e. For periodically unattended machinery plant operation, automatic restoration of ship's service electrical power in less than 30 seconds, including automatic load shedding, if provided.
- Fire Detection and Extinguishing Systems
 - a. Testing of the required machinery extinguishing systems.
 - b. For minimally attended machinery plant operation, testing of fire detection system control panel and fire detectors in the machinery spaces.
 - c. For periodically unattended machinery plant operation, remote fire and fire pump alarms.

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- Flooding Safety
 - a. Testing of controls of bilge pumps and machinery bilge level sensors.
 - b. For periodically unattended machinery plant operation:, remote flooding alarms.
 - Internal Communications
 - a. Engineers' call system
 - b. Engineers' assistance-needed alarm
 - c. Personnel alarm
 - Additional operational test procedures required for the following items:
 - a. Shaft speed and direction of thrust instrumentation.
 - b. For minimally attended machinery plant operation:, the alarm and instrumentation, including switchboard controls, of ship's service generators and power distribution.
 - c. For periodically unattended machinery plant operation, the remote power generation and distribution alarms.
 - d. The required controls of all fire pumps.
 - e. Excessive operation of automatic bilge pumps.
 - f. Controls of required watertight doors in the machinery spaces.
 - g. Engine order telegraph systems.
 - h. Sound powered telephone systems.
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Attachments

None